A significance of the Early Triassic oncolitic and oolitic facies – example from the Dinarides (Croatia)

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The section at Plavno locality near Knin in the central part of the Dinarides (Croatia) that represent the almost complete Early Triassic depositional sequence has some significant oncolitic and oolitic facies characteristics. The section was investigated by means of litho-, bio- and chemostratigraphy. Chemostratigraphy (δ^{13}C-isotope values) enabled tho establish boundaries within ca 1.000 m thick sequence. The sequence represents the main Early Triassic depositional features that characterise the wide Dinaridic region. It was a low-energy depositional environment of a broad epeiric ramp and differs that of the Early Triassic sections in the Southern Alps and Bükk Mts. interpreted as a ramp (Brandner et al., 2012; Haas et al., 2007).

Plavno succession has threefold division to 1) carbonates representing the oldest Early Triassic strata (lower part of Griesbachian); 2) dominantly red clastics (shale, siltstones and sandstones) with intercalation of oncoid/ooid or bioclastic rich grainstones (uppermost Griesbachian, Dienerian and Smithian) and 3) dominantly grey carbonaceous lime mudstones, marls and calcisiltites with ammonoids representing Spathian-Anisian strata. The oldest rocks - pale yellow macrocrystalline subhedral dolomites (Griesbachian) were determined by the presence of conodonts *Isarcicella staeschei* and *I. isarcica* and. In the dolomites ghosts of rare microspheres and ostracods can be observed. *Earlandia* and *Cornuspira* present in this interval point to the stressful conditions related to the end Permian mass extinction. Primary fabric of carbonate grains and bioclasts cannot be observed because it has been obliterated by secondary dolomitization. Nevertheless, in the younger strata (at the uppermost Griesbachian and Dienerian) within dominantly clastic deposition rare oncolith rich dolomite/limestone beds occur. Oncoliths are large grains, up to 2,5 mm in size, with typical microbial cortices. Presence of microbial oncoliths fits to the interpretation of biotically-induced precipitation. This type carbonate production has been related to the stressful PTB conditions and interpreted as disaster or anachronistic microfacies (e.g. Kershaw et al., 2012, Baud et al., 2005 and many others). Microbialites occur as earliest Triassic strata on many localites, usually in the form of stromatolites or thrombolites, but oncoliths may also point to another form of microbial presence in the aftermath period before the recovery in the Early Triassic (Weidlich, 2007). In the younger Dienerian strata coated grains have different textural and compositional characteristics. They are fairly spherical grains characterised by simple fabric, small sizes (0,08-0,3 mm), overall good sorting and they resemble more to ooids then to oncoids. Grains are composed usually of calcite crystals as nuclei that are encrusted by 1-3 thin micritic laminae. Calcite crystals show microborings(?) suggesting their primary precipitation on the sea floor. Similar ooid characteristic occurred in the well known Tessero horizon of the Southern Alps and was tentatively interpreted as possible microbial features (Brandner et al., 2012 opposing Farabegoli et al., 2007). Some beds are composed dominantly of coated bioclasts which can also be a consequence of microbial coating. More complex ooid fabric occurred for the first time in Smithian. Ooids are bigger then previously described ones of simple type (0,4-07 mm). They consist of bioclastic nuclei (usually ostracods) and cortex of concentric and radial-fibrous microfabrics. The thickness of oolite beds increases toward Smithian-Spathian boundary representing a regressive trend in a depositional environment. Well-defined shoreface or oolitic shoal/barrier complexes were not developed. Instead coarse grained concentric and radial-fibrous ooids can form in a relatively narrow high energy band marking the impingement of fair-weather waves on the sea floor at the proximal-distal ramp contact.

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